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(71) Applicant: Van 't Hooft, Eric
Gezichtsstraat 16
NL-3956 BB Leersum(NL)

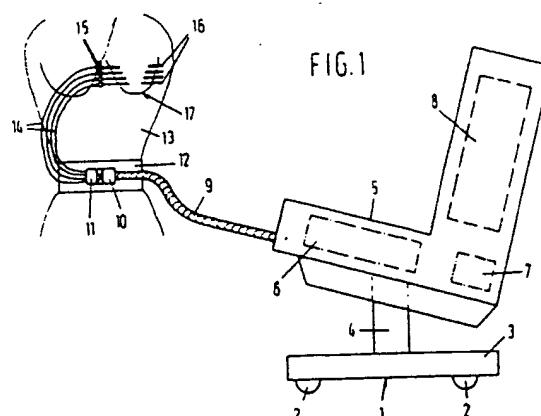
(72) Inventor: van 't Hooft, Eric
Gezichtsstraat 16
NL-3956 BB Leersum(NL)
Inventor: van Zwol, Libbe
Dreef 5
NL-3956 EP Leersum(NL)

(74) Representative: Smulders, Theodorus A.H.J.,
Ir. et al
Vereenigde Octrooibureaux Nieuwe Parklaan
107
NL-2587 BP 's-Gravenhage(NL)

(54) Apparatus for positioning radioactive source material in at least one hollow implant needle
implanted in the body of a patient.

(57) Apparatus for positioning radioactive source material in at least one hollow implant needle implanted in the body of a patient. The apparatus comprises: a container (6) for one or more radioactive source assemblies (55); a transfer tube (14) having a first end connected to the container and a second end for connecting the tube via a needle connector (15) with the at least one implant needle (16), and a mechanical drive for the radioactive source assembly from the container through the transfer tube to the implant needle. According to the invention, the apparatus is characterized by a patient belt (12) adapted to retain applicators (16) in the body of a patient (13). The belt can be disposed on the body

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of a patient to be treated, and is provided with a connector (11) to which on one side a single transfer tube or a multi-channel socket connector (10) can be connected and on the other side a number of single transfer tubes (14) can be connected for delivery of radioactive source assemblies to a patient.



**Apparatus for positioning radioactive source material in at least one hollow implant needle implanted
in the body of a patient**

This invention relates to an apparatus for positioning radioactive source material in at least one hollow implant needle implanted in the body of a patient comprising a container for storing at least one radioactive source assembly; said container containing radioactive source assemblies; a transfer tube having a first end connected to the container and a second end for connecting the tube via a needle connector with the at least one implant needle; mechanical means to drive the radioactive source assembly from the container through the transfer tube to the at least one implant needle.

Such an apparatus is known from US-A-3,669,093 (Sauerwein). In this known apparatus use is made of a transfer tube of which the first end has a terminal coupling for connection with the container and the second end ends into a hollow closed-ended probe, i.e. this transfer tube has to be engaged or from the patient or from the container. This means that it is never quite sure if the radioactive material arrives on the right place.

It is an object of the invention to improve this known method.

To this end, the apparatus includes a patient belt adapted to retain applicators in the body of a patient; said belt adapted to be disposed on the body of a patient to be treated; said belt is provided with a connector to which on one side a single transfer tube or a multi-channel socket connector can be connected and on the other side a number of single transfer tubes can be connected for delivery of radioactive source assemblies to a patient.

One embodiment of an apparatus for treating the part of a body with radioactive material will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic side view of an apparatus for treating the part of a body with radioactive material;

Fig. 2 shows a storage container employed when using the apparatus shown in Fig. 1;

Fig. 3 shows an enlarged detail of the apparatus shown in Fig. 1;

Fig. 4 shows an enlarged detail of the apparatus shown in Fig. 3;

Fig. 5 shows a perspective bottom view of the guide;

Fig. 6 shows an enlarged detail of the apparatus shown in Fig. 1; and

Fig. 7 shows the enlarged transport thread with coupling elements used in the apparatus shown in Figs. 1-6 for transporting radioactive ma-

terial.

As shown in Figs. 1-7, an apparatus for treating the part of a body with radioactive material comprises a cart 1 with wheels 2 supporting a base 3 whereon a leg 4 is mounted. Leg 4 carries a housing wherein, diagrammatically shown, there are arranged an intermediate container 6, a drive mechanism 7 and a control mechanism 8. The intermediate container connects to an external tube 9 whose free end is fitted with a machine connector 10. Said machine connector 10 is adapted for coaction by means of locking members, not shown, with a patient connector 11 affixed to a patient belt 12 disposed on the body 13 of a patient to be treated. From the patient connector, there extend a plurality of patient transfer tubes 14, the ends of which are connected through needle connectors 15 to implant needles 16 disposed in a breast 17 of the patient.

The means necessary for treating a patient with radioactive material further comprise a storage container 18 (see Fig. 2), which is fitted at the top with a plurality of connectors 19 connecting to the passages, now shown, provided within the storage container, said passages each containing a tube with radioactive material. Storage container 18 is further provided with a support 20 to which there is attached a container connector 21 corresponding with the patient connector 11. The openings in the container connector 21 connect to the bottom of a plurality of selection tubes 22 whose free ends are fitted with selection tube connectors 23 adapted for coaction with connectors 19.

As shown in Figs. 3, 4 and 5, the drive mechanism 7 comprises a disc 24 whose circumference has teeth 25 adapted for coaction with a worm 26, driven by a motor 27. The disc 24 is fitted at its top surface with a spiral groove 28 receiving a transport thread 29. Disc 24, worm 26 and motor 27 are received in a housing 30, not shown in Figs. 4 and 5 for the sake of clarity. Housing 30 contains an outlet 31 for the transport thread 29.

To ensure a proper discharge of the transport thread from the spiral groove 28 via the opening 31, there is provided in an upper plate 32 for the disc 24 a radial slot 33 wherein a support 34 can move (see the perspective bottom view shown in Fig. 5).

Support 34 is fitted with a guide channel 35 for the transport thread. As shown in Fig. 5, the support is fitted at the bottom with a lip 36 extending into the groove 28 of the disc, thus ensuring a proper guiding by the support.

The support is fitted at the top with a slot 58 wherein a guide arm 37 is disposed whose one end is rotatably mounted on a shaft 38, which adjacent outlet 31 is attached to the upper plate 32. Furthermore, the guide arm 37 is fitted at the bottom with a groove 59 whose one end connects to the guide channel 35 in the support 34, its other end connecting to the outlet 31 in the housing.

As further shown in Fig. 3, the outlet 31 connects to a tube 39, which extends with a bent portion through the intermediate container 6. The other end of the tube 39 connects via a coupling 40 to a patient transfer tube 14. A number of such patient transfer tubes 14 are received in the external tube 9 (see Fig. 1): It is observed in this respect that the patient transfer tubes disposed on the body of the patient to be treated and those, contained in the external tube 9 are indicated by the same reference numeral, since the same patient transfer tubes are concerned here which are interconnected through machine connector 10, and the patient connector 11, respectively.

As shown in Fig. 3, the coupling 40 connects to a tube 41, which is connected to the pressure vessel 43 by means of a valve 42. Tube 41, upstream of the valve 42, is connected to a pressure transducer 44.

Claims

Apparatus for positioning radioactive source material in at least one hollow implant needle implanted in the body of a patient comprising:
 a container (6) for storing at least one radioactive source assembly (55);
 said container (6) containing radioactive source assemblies (55);
 a transfer tube (14) having a first end connected to the container and a second end for connecting the tube via a needle connector (15) with the at least one implant needle (16);
 mechanical means to drive the radioactive source assembly from the container through the transfer tube to the at least one implant needle;
 characterized by a patient belt (12) adapted to retain applicators (16) in the body of a patient (13);
 said belt adapted to be disposed on the body of a patient to be treated;
 said belt is provided with a connector (11) to which on one side a single transfer tube or a multi-channel socket connector (10) can be connected and on the other side a number of single transfer tubes (14) can be connected for delivery of radioactive source assemblies to a patient.

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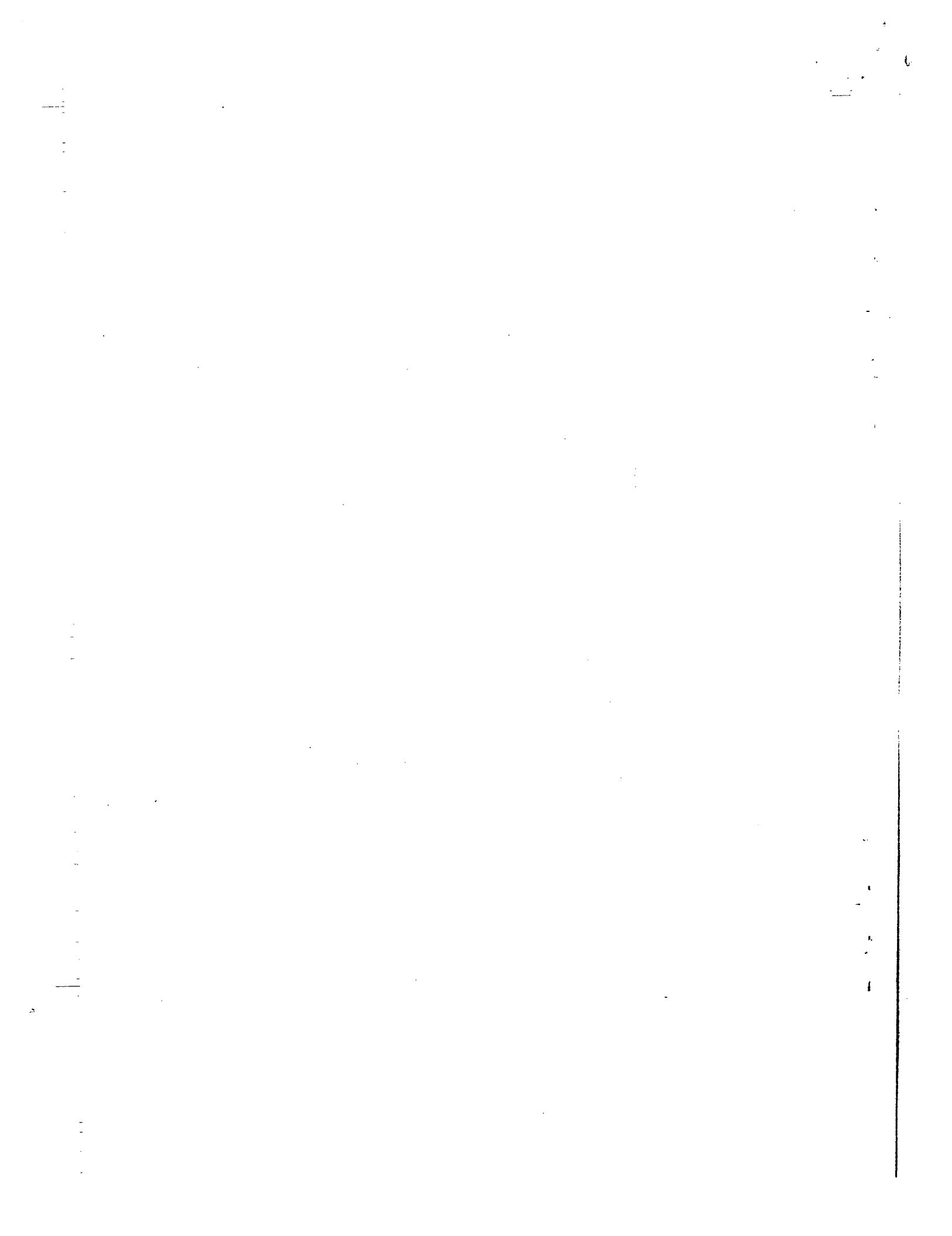
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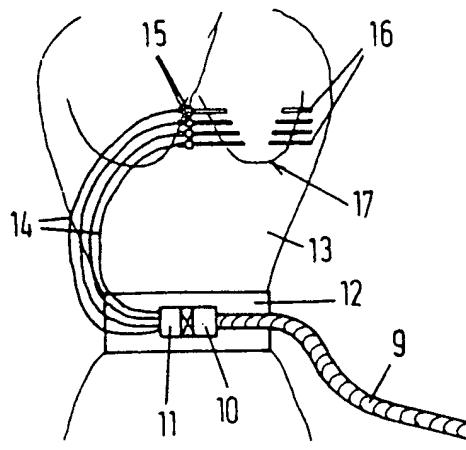


FIG.1

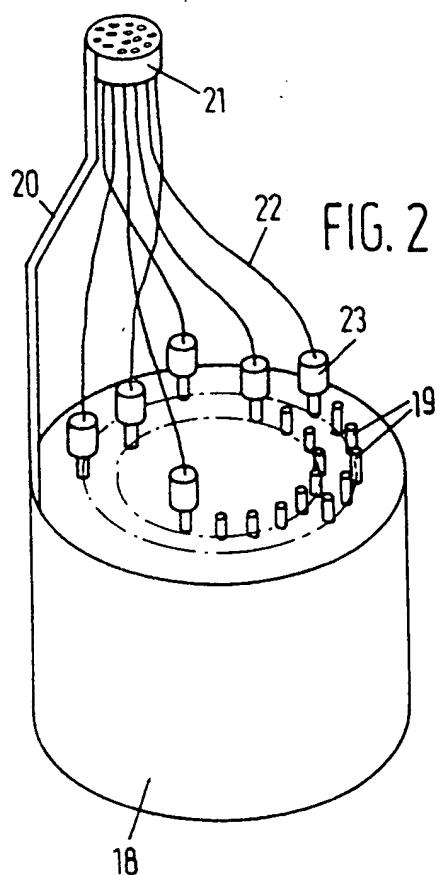
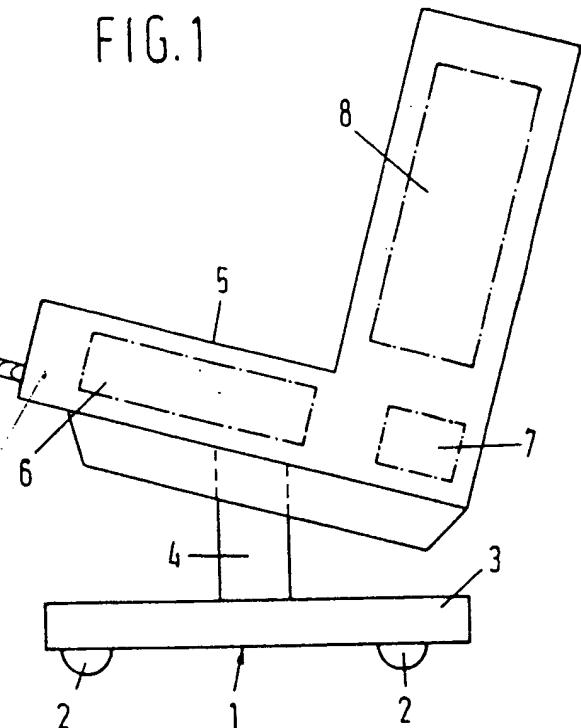


FIG.2

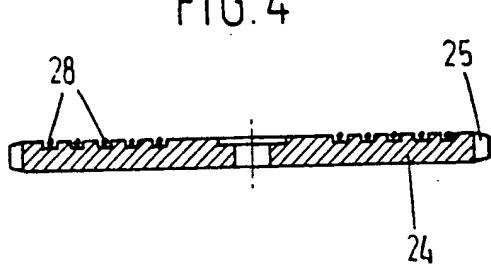


FIG.4

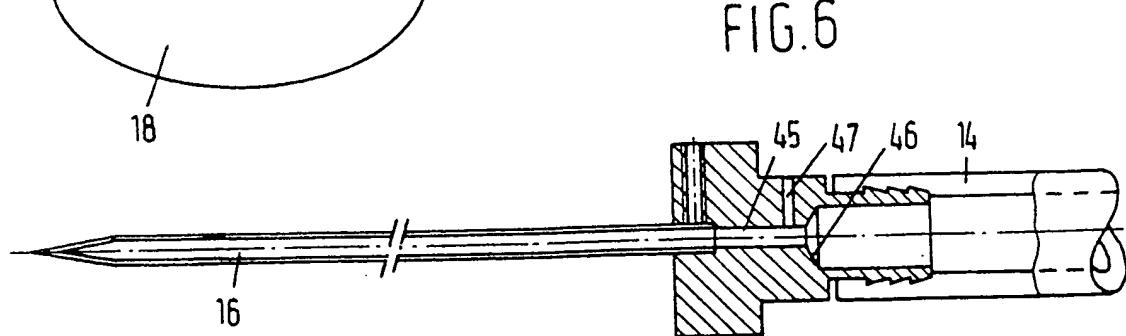
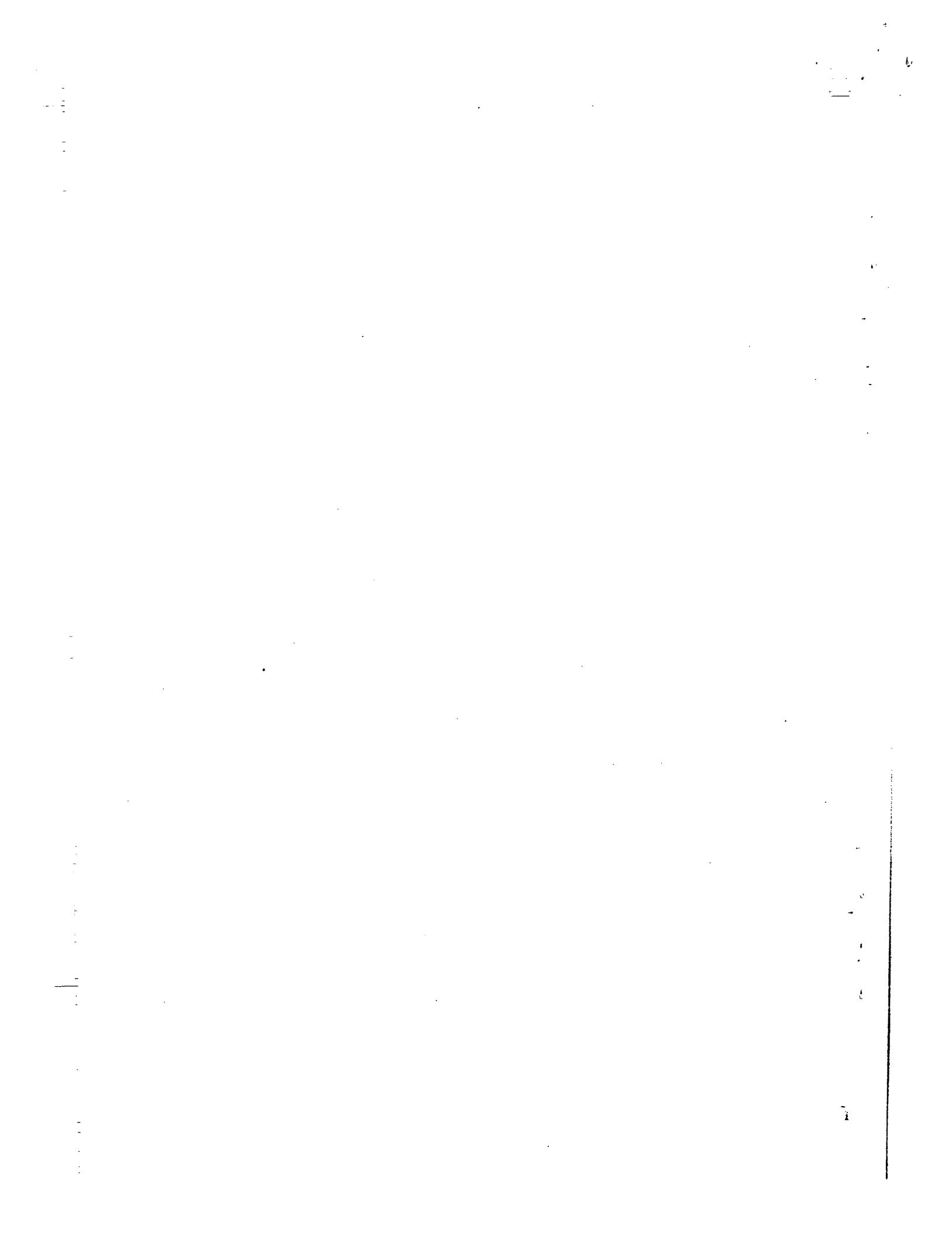
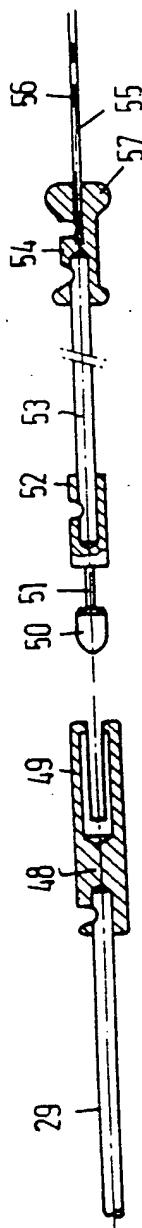
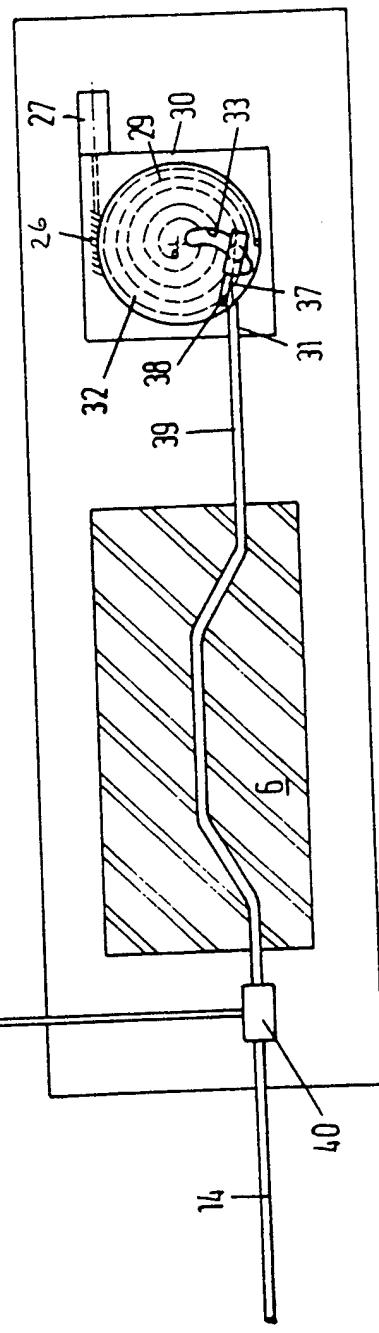
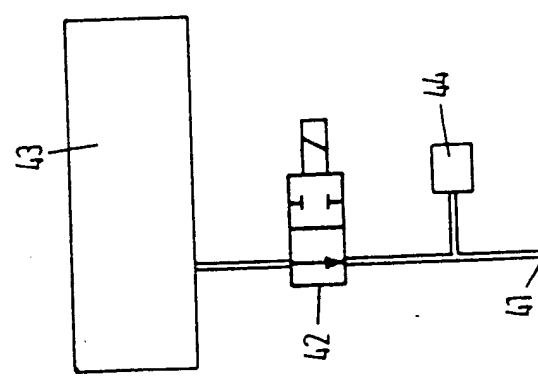
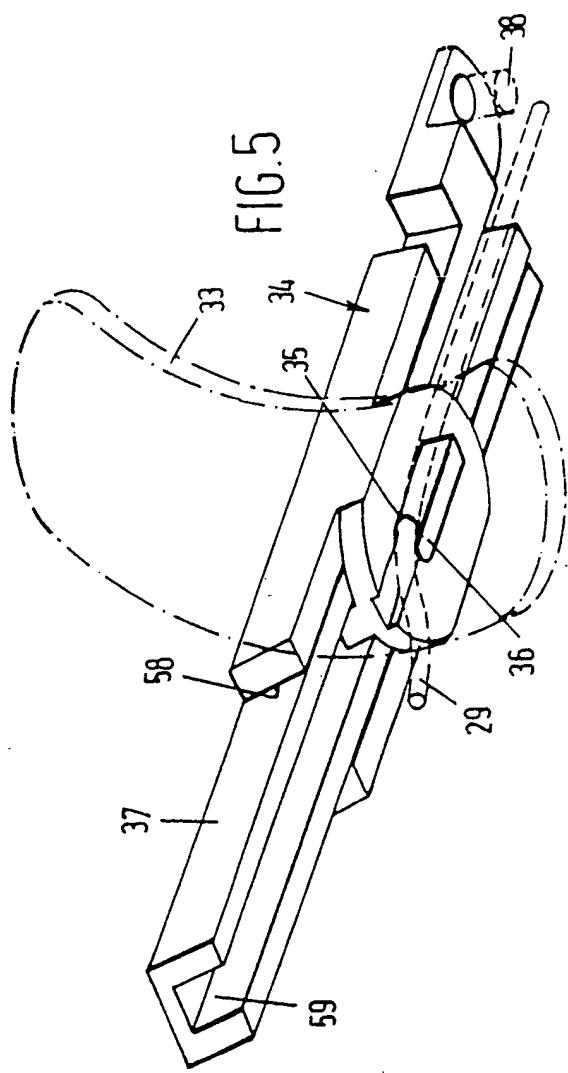
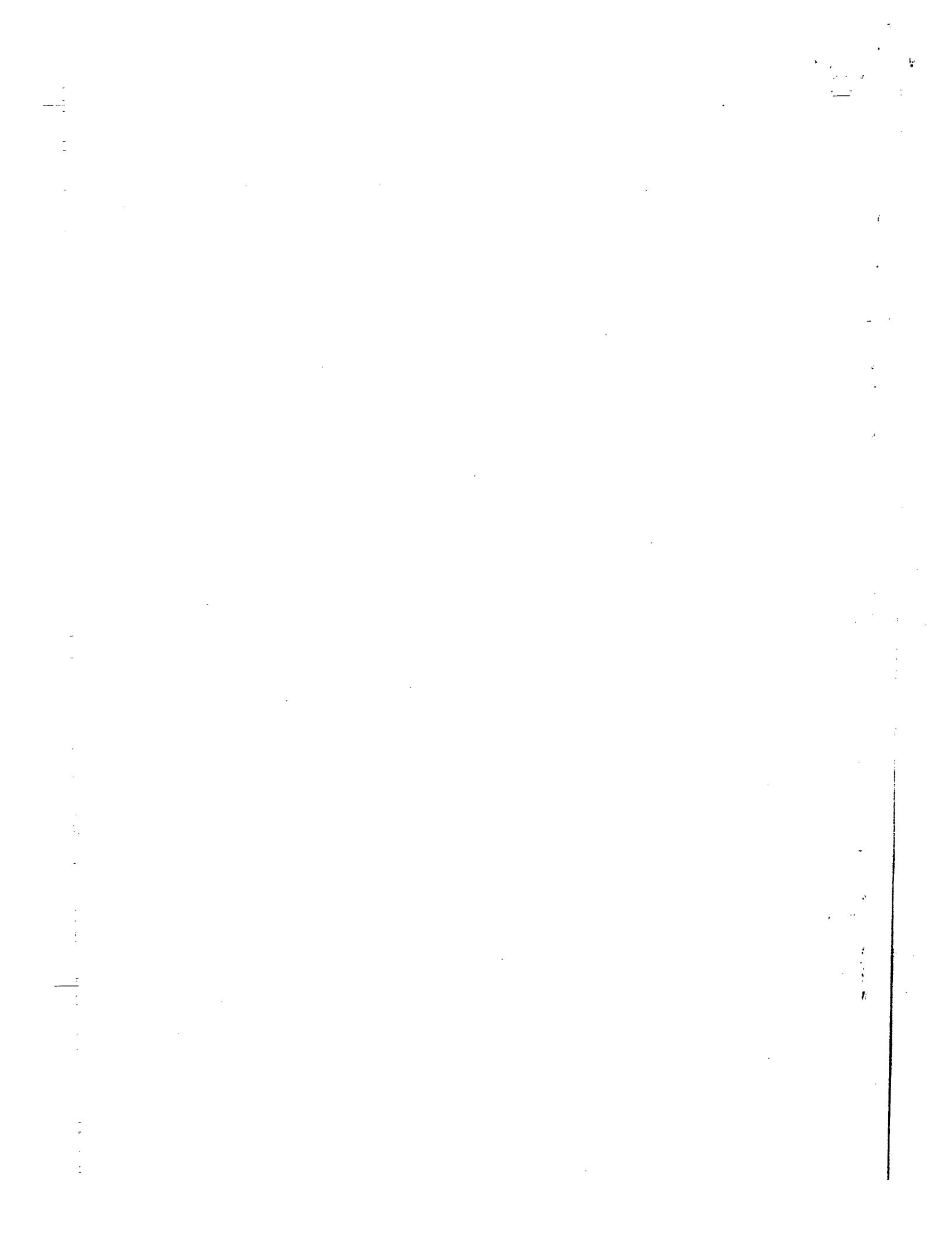


FIG.6







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(71) Applicant: Van 't Hooft, Eric
Gezichtsstraat 16
NL-3956 BB Leersum (NL)

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(72) Inventor: van 't Hooft, Eric
Gezichtsstraat 16
NL-3956 BB Leersum (NL)

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van Zwol, Libbe
Dreef 5
NL-3956 EP Leersum (NL)

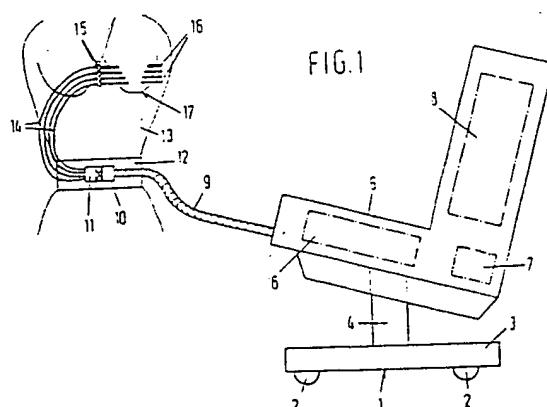
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(74) Representative: Smulders, Theodorus A.H.J., Ir. et al
Vereenigde Ocroobureaux Nieuwe Parklaan 107
NL-2587 BP 's-Gravenhage (NL)

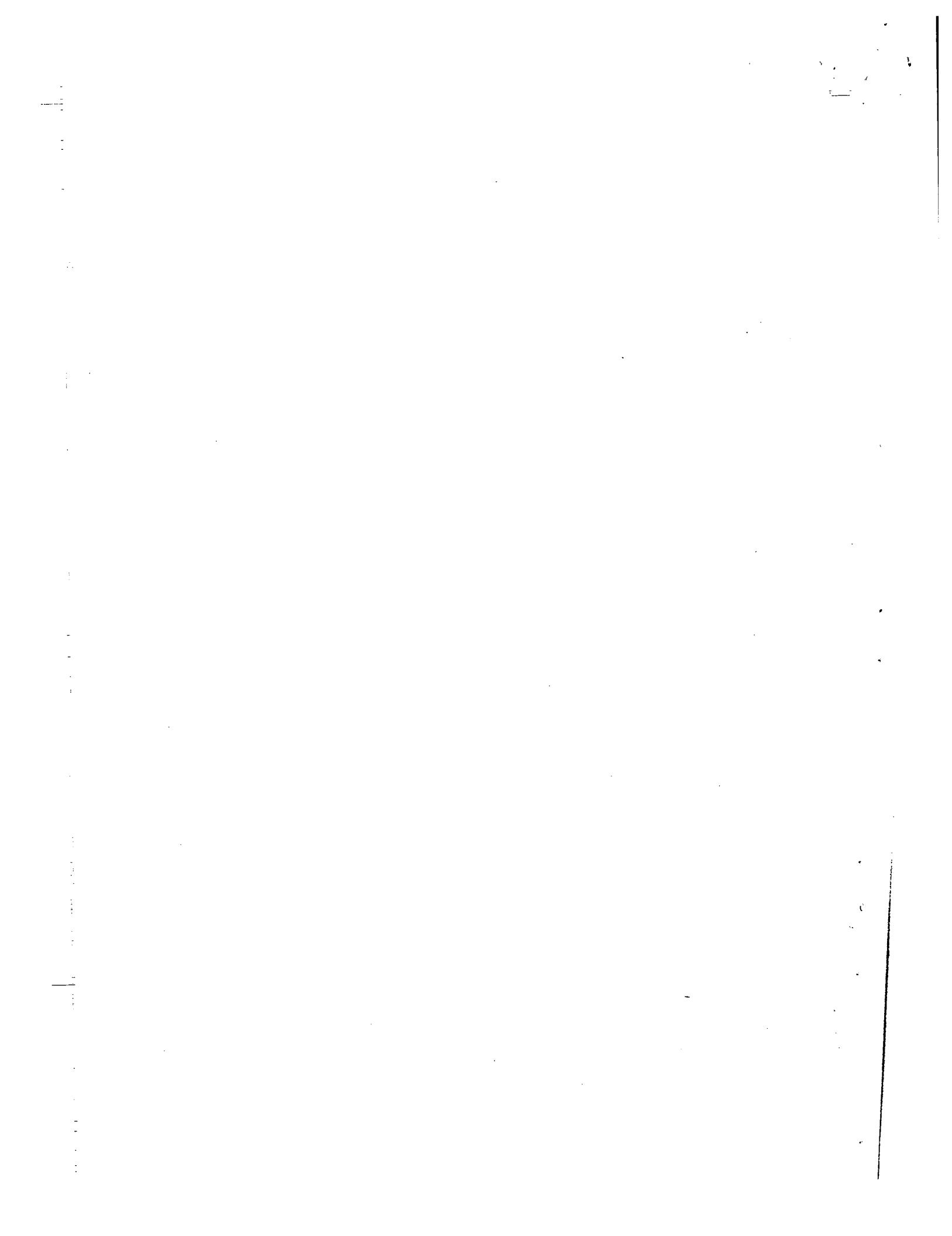
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(54) Apparatus for positioning radioactive source material in at least one hollow implant needle implanted in the body of a patient.

(55) An apparatus for positioning radioactive source material in at least one hollow needle (16) implanted in the body of a patient (13), comprising a container (6) for one or more radioactive source assemblies (55); a transfer tube (14) having a first end connected to the container (6) and a second end connected via a needle connector (15) to one or more implanted needles (16), and a mechanical drive (7) for selected delivery of a radioactive source assembly from the container (6) through the transfer tubes (9,14) to the implant needles (16). The apparatus also includes a patient belt (12) disposed on the body of the patient to be treated and adapted to retain the implant needles (16) in the body of the patient (13). The belt (12) can be provided with a number of transfer tubes (14) and a connector (11) to be linked to a multi-channel socket connector (10) for delivery of radioactive material to the patient.



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EUROPEAN SEARCH REPORT

Application Number

EP 89 20 1824

DOCUMENTS CONSIDERED TO BE RELEVANT									
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)						
Y	FR-A-2 207 734 (J. SWYNGEDAUW) * Page 2, lines 23-33; page 3, lines 1-6, 25-34; figures 1-4 * --- US-A-4 198 989 (D. HAWKE et al.) * Column 2, lines 1-36; figures 1-5 * ---	1	A 61 N 5/10 A 61 M 25/02						
A	DE-B-1 095 963 (F. WACHSMANN) * Column 1, line 37 - column 2, line 32; column 2, line 48 - column 3, line 43; figures 1,2 * ---	1							
A	DE-A-1 566 673 (VYGON S.A.) * Page 8, line 1 - page 10, line 21; page 13, lines 15-25; figures 1-9,13 *	1							
A	US-A-4 087 864 (L.D. LABOVE et al.) * Abstract; column 2, lines 19-33; column 3, lines 3-36; column 4, lines 26-50; figures 1-4 * -----	1							
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)						
			A 61 N A 61 M A 61 B						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>19-10-1989</td> <td>RIEB K.D.</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	19-10-1989	RIEB K.D.
Place of search	Date of completion of the search	Examiner							
THE HAGUE	19-10-1989	RIEB K.D.							
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